

Understanding the association between COVID-19 and new-onset diabetes in children, including diabetic ketoacidosis (DKA)

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Commentary on: Ponmani, C., Nijman, RG. Roland, D. et al. (2023). Children presenting with diabetes and diabetic ketoacidosis to Emergency Departments during the COVID-19 pandemic in the UK and Ireland: an international retrospective observational study. *Arch Dis Child* (0) 1-9 doi:10.1136/archdischild-2022-325280

Commentary

Implications for practice and research

- In the context of newly emerging SARs-CoV-2 variants, education on self-management of sick day rules for children with diabetes and their parents is imperative to avoid decompensating diabetic ketoacidosis (DKA)
- Prospective research is needed to examine new-onset diabetes accompanied by a diagnosis of SARs-CoV-2

Context

There is a need for a better understanding of the association between new-onset diabetes mellitus and SARs-CoV-2 in children, including DKA in the newly diagnosed and DKA in those with pre-existing diabetes. Ponmani et al. [1] retrospectively reviewed children aged six months to 16 years who presented in emergency departments (ED) in the UK and Ireland with 1) new-onset type 1 (T1D) or type 2 (T2D) diabetes; 2) Diabetic ketoacidosis (DKA) during the COVID-19 pandemic in comparison with the preceding year.

Methods

The study aimed to describe the Incidence of new-onset paediatric T1D or T2D, patterns of emergency department (ED) presentations during the COVID-19 pandemic and if SARS-CoV-2 infection was associated with these variables through a retrospective cohort study. Data collection exclusively involved a review of the medical records from 49 paediatric emergency departments that were members of Paediatric Emergency Research in the UK and Ireland (PERUKI) following the Guidelines for Strengthening the Reporting of Observational Studies in Epidemiology.

Data included demographics, symptoms, physical examination results, physiological parameters and presentation, family history, co-morbidities, Covid-testing, HbA1c, pancreatic antibodies, and factors related to the delay in presenting. The diagnostic intervals were determined by the period from self-reporting diabetes symptoms until admission to the hospital. Objective-classified diagnostic criteria determined diabetes and the severity of DKA.

Findings

New-onset diabetes increased by 17% in year two (n =1183) compared to year one (n =1015). This variable did not report statistical significance. The finding is higher

than the national diabetes incidence over the last five years, but there was limited Covid-testing among the participants.

DKA associated with pre-existing T1D had a 27.8% reduction in attendance during the pandemic (Year Two). In new-onset T1D, there was a 43% increase in DKA, with severe DKA increasing by 79% ($p < 0.05$). The findings were in the context of unchanged patient demographics and symptom duration between both years.

Commentary

This study focused on the association between new-onset pediatric diabetes mellitus and SARS-CoV-2. Research areas of contention regarding the incidences of new diagnoses of T1D in children during the pandemic. While some studies show a statistically significant increase in new T1D diagnoses [2–4], Reschke et al., through predictive modelling, claim the rise follows the trajectory of the global Incidence of T1D. There is an overall underreporting of co-existing SARS-CoV-2 with new onset T1D in children.

An increased Incidence and severity of DKA in newly presenting T1D during the pandemic is reported with later presentations and severe DKA [4,5]. Contributory factors include isolation, fear of COVID-19, and difficulty accessing health providers. Ponmani et al. identified effective self-management strategies during year two by parents and children with pre-existing T1D, avoiding hospital admission and the severe consequences of DKA. Sick-day self-management is a fundamental skill for people with T1D [6]. Therefore, policymakers need to consider sick-day self-management training within the broad spectrum of people regularly involved with children with diabetes, including healthcare, education, and activity providers. Educating those teams working with children and families could maintain reduced hospital admission with DKA and improve quality of life. Sick-day rule training may impact workforce planning within these environments, who are already under pressure, which is a potential barrier.

Future studies would benefit from a prospective approach, including routine testing for SARS-CoV-2 in children with new-onset diabetes and associated DKA.

References

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